UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SR- 6J

December 20, 2011

Mr. Michael J. Erickson
Associate Vice President/Principal Engineer
ARCADIS
10559 Citation Drive, Suite 100
Brighton, Michigan 48116

RE: Area 1: Revised Supplemental Remedial Investigation Report

Dear Mr. Erickson:

The United States Environmental Protection Agency (EPA) has completed its review of the revised Area 1 Supplemental Remedial Investigation (SRI) Report, submitted on October 3, 2011, for the Allied Paper,Inc./Portage Creek/Kalamazoo River Superfund Site.

This revised SRI report focuses on the nature and extent of contamination within Area 1 of the Kalamazoo River from Morrow dam to the former Plainwell dam, and includes portions of Portage Creek from Alcott Street to the confluence of the Kalamazoo River. Although the revised SRI report is significantly improved, several issues with the revised SRI report remain and must be addressed. Enclosed are EPA's comments with required modifications to the Area 1 revised SRI report.

Therefore, EPA disapproves the revised Area 1 SRI report pending receipt of Georgia Pacific, LLC's (Georgia Pacific) responses to the enclosed comments and a final SRI report incorporating the modifications. Georgia Pacific must submit its responses to the enclosed comments and a final SRI report within (60) sixty days of receipt of this letter. Failure to submit a final report to EPA implementing the modifications and curing the deficiencies identified in the enclosure may be considered a material defect and may subject Georgia-Pacific to stipulated penalties pursuant to Section X of the Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study (CERCLA Docket No. V-W-07-C-864).

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

James A. Saric
Remedial Project Manager
SFD Remedial Response Branch #1

Enclosure

cc: Paul Bucholtz, MDNRE
Garry Griffith, Georgia-Pacific
Richard Gay, Weyerhaeuser

Bcc w/enclosure:

Leslie Kirby-Miles, ORC
Jeff Keiser, CH2MHILL

U.S.EPA COMMENTS
ON THE REVISED
AREA 1 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SITE

SPECIFIC COMMENTS

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 1

Second paragraph: ". . . the PCBs were inadvertently and unknowingly released into the mills' waste streams . . ." Delete the phrase "inadvertently and unknowingly."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 2

Key findings, second bullet – ". . . most of the river channel in Area 1 is primarily non-depositional." Change "is primarily non-depositional" to "is primarily in dynamic equilibrium." Revise the second sentence as follows: "This means that sediments settle out of the water column during receding flows, but are susceptible to movement during increased flows. However, there are no extensive areas of long term sediment accumulation."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 3

Key findings, third bullet – this bullet summarizes the mass of PCBs in each area of the river. Add the following sentence to the end of this bullet: "PCB mass is not an indicator of potential ecological or human health risks from exposure to PCBs."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 4

Key findings, fourth bullet – this bullet lists the primary locations where PCBs remain in Area 1. Revise the first sentence as follows: "PCBs remaining in Area 1 sediments are primarily located in the lower section of Portage Creek, a few localized deposits of sediment near the city of Kalamazoo, and in the Crown Vantage area (see map on page ES-2). PCBs remaining in Area 1 exposed former sediments are located in the former Plainwell Impoundment and the Plainwell #2 Dam area."

Commenting Organization: EPA **Commenter: White/Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 5

Key findings, fifth bullet – This bullet lists SWACS for different sections of Area 1. Add the following sentence to the end of this bullet: "For exposed former sediments, the SWAC in the former Plainwell Impoundment is 6.4 mg/kg, and the SWAC in the Plainwell #2 dam area is 2.4 mg/kg."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 6

Key findings 5th bullet -- Include in this or a new bullet the maximum concentrations detected within each reach to provide balance to the fifth bullet. Also include "SWAC calculations presented in the SRI may be modified in future documents to reflect smaller areas of interest"

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 7

Key findings, 6th bullet – This bullet summarizes PCB loads in the water column. Add the following sentence to the end of this bullet: "Surface water sampling does not capture PCB loads from transient sediment transport events that occur between sampling events."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 8

Key findings, 6th bullet – Include either here or in a new bullet "Morrow Lake may have limitations for use as a reference site due to impounding, other areas upstream of Morrow Lake may be considered for use as reference site which are geomorphologically similar."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 9

Key findings, 6th bullet – Include either here or in a new bullet "While other external PCB sources (e.g., direct discharges, non-point sources such as atmospheric deposition) may exist, none of these have been quantified as major PCB sources"

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 10

Key findings, 8th bullet – This bullet summarizes the removal actions in the former Plainwell Impoundment and the Plainwell #2 Dam area. Add the following sentence to the end of the bullet: "The potential for future erosion of the exposed former sediments by lateral migration of the river channel has not been evaluated."

Commenting Organization: EPA **Commenter: Dillon**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 11

Key findings 9th bullet – Add the following text before the last sentence of the bullet. As agreed to, the TBERA focuses on specific data sets to draw risk conclusions. While, the data and analysis presented in the TBERA are sufficient to complete the risk assessment, they are not considered comprehensive. Other data and analysis approaches are available and in order to inform sound risk management decisions will be considered in developing Remedial Action Objectives (RAOs), preliminary remediation goals (PRGs) and evaluations of remedial alternatives.

Commenting Organization: EPA **Commenter: Dillon**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 12

Key findings 9th bullet – This bullet summarizes the results of the TBERA in the former Plainwell and Plainwell No. 2 impoundments. The text states: *"remaining concentrations of PCBs in the floodplains in these areas are low enough that they do not present a risk to many ecological receptors that live and feed primarily within terrestrial environments. There are some wildlife species that are particularly sensitive to PCBs, and for those species, risk is possible, but the weight of evidence analysis presented in the TBERA indicates ecological risks are unlikely."* The text as written understates the potential for site-related effects. Change the text to read: "remaining concentrations of PCBs in the floodplains in these areas may pose risk to some receptors that live and feed primarily in the terrestrial environment, but appear to be low enough that they do not present a risk to other ecological receptors at the Site."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 13

Key findings 9th bullet – This bullet summarizes the results of the TBERA in the former Plainwell and Plainwell No. 2 impoundments. Identify the sensitive species along with the ranges that exceed risk levels at both the high and mid sensitivity range for each of the areas and each approach.

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 14

Key findings, 12th bullet – This bullet describes trends in surface water, fish tissue, and sediment PCB concentrations. "Repeated sampling of surface sediments indicates that peak and average concentrations are declining, but that overall results between sampling events are not statistically different . . . " Revise this sentence as follows: "Repeated sampling of surface sediments indicates that peak and average concentrations declined between 1993/1994 and 2008, but that overall results between sampling events are not statistically different . . .." Two sampling events are insufficient to establish a long-term trend.

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 15

Key findings 13th bullet, -- this bullet describes the MDEQ fish trends analysis. Revise the bullet to incorporate the study's findings that 1) under current conditions, PCBs are slowly declining 2) Fish consumption advisories for small mouth bass are expected to exist for at least 20 years and may remain for decades.

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 16

Key findings 14th bullet – This bullet describes the potential health risks associated with consumption of fish by anglers. Revise the bullet to provide CT and upper bound risk ranges for subsistence and high end sport angler.

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 17

Conclusions and Next Steps, first bullet – Revise the first sentence as follows: "The amount of PCBs in Area 1 sediments and exposed former sediments is a small percentage . . ." Revise the second sentence as follows: "Exceptions are lower Portage Creek (which will be addressed by the USEPA-led removal action in Portage Creek starting in Fall 2011), the "urban section" of the Kalamazoo River near Kalamazoo, the Crown Vantage area, and the former Plainwell impoundment and Plainwell #2 dam area."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 18

Conclusions, second bullet – Delete the last sentence from this bullet, it is out of context. The TBERA does not discuss recreational risk.

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 19

Conclusions – insert a new bullet immediately following the TBERA summary which states "Human health risks from the consumption of fish are gradually declining but still exceed acceptable levels set by the USEPA. In addition, a risk assessment performed by MDEQ indicated that PCB concentrations in sediment may pose a risk to sensitive fish-eating predators, such as mink."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 20

Conclusions, third bullet – In the first sentence, delete the phrase "which is relatively low." Delete the second sentence because comparison to an analytical detection limit is irrelevant with respect to potential risks. Revise the fourth sentence as follows: "However, it is likely that the residual PCB concentrations in the former Plainwell Impoundment channel sediments will continue to attenuate . . ." Add the following two sentences to the end of this bullet: "The

SWACs for exposed former sediments in the former Plainwell Impoundment and Plainwell #2 dam area are 6.4 mg/kg and 2.4 mg/kg, respectively."

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 21

Conclusions, 4th bullet – Revise the third sentence as follows: "Repeated sampling of surface sediments indicates that peak and average concentrations declined between 1993/1994 and 2008, but that overall results between sampling events were not significantly different."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 22

Conclusions 4th bullet—add the following "SWAC calculations presented in the SRI may be modified in future documents to reflect smaller areas of interest"

Commenting Organization: EPA **Commenter: White**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 23

Conclusions, fifth bullet – add the following sentence to the end of the bullet: "The potential for future erosion of the stream banks, floodplain soils and exposed former sediments by lateral migration of the river channel area has not been evaluated."

Commenting Organization: EPA **Commenter: Keiser**
Section: Executive Summary **Page #: Executive Summary** **Lines #: NA**
Specific Comment #: 24

Conclusions add a bullet, "Only select hotspot and side channel areas were evaluated in the RI, further investigation of the remaining areas may be required prior to remediation if warranted.

Commenting Organization: EPA **Commenter: Saric**
Section: 1 **Page #: 1-5** **Lines #: NA**
Specific Comment #: 25

Page 1-5, paragraph 2, 5th and 6th lines: strike "river, and transfer of their liabilities for the Allied OU to a custodial trust (Le Petomane . . .)." replace with "Site."

Paragraph 3, 3rd and 4th line: strike "Le Petomane XXIII, in coordination with USEPA, is responsible for future work at the Allied OU,"

Commenting Organization: EPA **Commenter: Keiser**
Section: 2 **Page #: General** **Lines #: NA**
Specific Comment #: 26

Prepare and bring forward into the section a summary table of other chemicals of concern identifying which are co-located and which are not co-located to support the discussion in Section 2.1.1.

Commenting Organization: EPA **Commenter: Keiser**
Section: 6 **Page #: General** **Lines #: NA**
Specific Comment #: 27

The number of samples and a breakdown of the number of samples exceeding 0.5, 1, 5, 10 and 50 ppm should be added to each of the tables summarizing SWAC or Mass calculations.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: N/A** **Lines #: NA**
Specific Comment #: 28

Section 6.1 and Table 6-3 – Update the text in Section 6.1 and the sample numbers in Table 6-3 to reflect the incorporation of MDEQ data in the discussion of nature and extent of contamination in the Plainwell area.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: 6-69** **Lines #: NA**
Specific Comment #: 29

Page 6-69 of the redline/strikeout (RLSO) – revise the first bullet as follows: "PCBs in the natural floodplains are relatively low in concentration compared to concentrations in the former impoundments." In the third bullet, delete the phrase "in average concentrations" (this appears to be an editing error). Delete the fourth bullet because it is an untested hypothesis rather than a conclusion.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: 6-70** **Lines #: NA**
Specific Comment #: 30

Page 6-70 of RLSO – delete the sentence immediately preceding Section 6.3.3.2 because the pre-TCRA SWACs are included in the next section.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: General** **Lines #: NA**
Specific Comment #: 31

The text indicates that the river is in dynamic equilibrium, but then makes the case that banks and deep sediment deposits are stable – these are incompatible interpretations. Section 7.1.1 – "However, during flood events, significant sediment can be supplied to the stream channel through the erosion and scour of both the river bed and banks."

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 32

Section 7.1.2, first paragraph – "In particular, much greater scour force maybe required to remobilize cohesively formed deposits . . ." Delete the word "much" and insert a space in maybe (may be). Also add a period to the end of the paragraph.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 33

Section 7.1.3, third paragraph, first sentence – Delete the phrase "like the Kalamazoo River." Neither the entire river, nor the channel in Area 1, are straight throughout. The Rosgen classification of B or C for Area 1 corresponds to moderate to high sinuosity.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 34

Section 7.1.3, fourth paragraph – Delete the first sentence. This sentence attempts to classify Area 1 as a low sinuosity channel with limited meandering and limited potential for bank erosion. However, the Rosgen classification of B or C corresponds to moderate to high sinuosity (Table 5-8), and the channel clearly meanders in some areas.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 35

Section 7.1.3, fourth paragraph, last sentence – Does the 34 acres of off channel areas represent only the areas that were sampled, or all off channel areas in Area 1? Delete this sentence if only the sampled off channel areas are considered.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 36

Section 7.1.5, last two sentences – "Banks that are made of cohesive clay and/or [are] covered with dense riparian vegetation are more resistant to erosion. Most of the river banks in Area 1 fit this description." Revise the second-to-last sentence as follows: "Banks that are made of cohesive clay and/or [are] covered with dense riparian vegetation are more resistant to erosion than sandy or unvegetated banks." Delete the last sentence because no data are presented to support this statement. The top of bank soil data presented in the RI report (the only data available) indicate a median silt/clay content of 19%.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 37

Section 7.1.6, first paragraph – delete the second half of the paragraph, starting with the sentence "In many reaches of the Kalamazoo River the bed is vertically sorted, with a coarse armor layer at the surface" and continuing to the end of the paragraph. This paragraph attempts to make the case that the channel bed is armored, which prevents the deeper, more contaminated sediments from being eroded. This is a broad generalization that cannot be applied to Area 1 as a whole. The figures that are cited (6—11b, 6-11c, and 6-11d) are not sufficiently detailed to assess whether the channel bed is in fact armored. In addition, no specific information is provided to support the hypothesis that more watershed erosion was occurring during the period when the finer grained sediments were deposited.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 38

Section 7.1.7, first paragraph – Delete the last sentence, which states "The new channel will be steeper and coarser compared to pre-TCRA conditions, and it will be non-depositional and likely armored as a result of sorting." The time frame represented by this statement is unclear, and the long-term evolution of river channel geomorphology in the Plainwell area was not evaluated in the RI.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: N/A** **Lines #: NA**
Specific Comment #: 39

Section 7.1.8, second paragraph, last sentence – delete the phrase ". . . this dissipates erosive energy, and where extensive vegetation is present, these banks are relatively stable." The information and analyses provided in the report are insufficient to conclude that the banks in the downstream portion of Area 1 are stable.

Commenting Organization: EPA **Commenter: White**
Section: 10 **Page #: N/A** **Lines #: NA**
Specific Comment #: 40

Section 10.3, 4th bullet – Delete the sentence that states "The observation of low SWAC concentrations for four of the six HSAAs that are in deeper water suggests that these deposits may have a high degree of stability attributable to the cohesive nature of the sediments in these areas, and the velocity and shear stress regime that these deposits experience." The velocity and shear stress regime in the HSAAs was not described or evaluated in the report, and the fact that sediment is cohesive does not necessarily impart a "high degree of stability." In the following sentence, delete the phrase " . . . .specifically, the presence of cohesive sediments with high percent solids, high silt and compacted clay content, and PCB concentration depth profiles . . ." Finer grained sediment tend to have a lower percent solids than coarser grained sediments, and there is no indication that clay-rich sediments are "compacted."

APENDIX B - TBERA

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: General** **Lines #: NA**
Specific Comment #: 41

The TBERA focuses on specific data sets to draw risk conclusions. While, the data and analysis presented in the TBERA are sufficient to document risk, they are not comprehensive. Other data and analysis approaches are available and in order to inform sound risk management decisions must be considered in developing Remedial Action Objectives (RAOs), preliminary remediation goals (PRGs) and evaluations of remedial alternatives.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: General** **Lines #: NA**
Specific Comment #: 42

In general the TBERA does not present the underlying data and calculations in a transparent format to allow for easy confirmation of calculations. While we do not request changes to the current presentation format, please include more detailed tables in the ERAs to be completed for the downstream areas.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: General** **Lines #: NA**
Specific Comment #: 43

The document is inconsistent in the use of scientific names. In many cases, the scientific name is given following the use of a common name for a species and in many cases it is not. For consistency, please always follow the first time use of a common name with its appropriate scientific name.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 1.2 **Page #: 1-5** **Lines #: 5-8**
Specific Comment #: 44

The text states that following the uncertainty section "risk-based media concentrations (RMCs) are developed for receptors found to be potentially at risk……" This approach was not used in the current version of the TBERA. Please delete the text in question.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 4.4.1 **Page #: 4-5** **Lines #: 11**
Specific Comment #: 45

In the dietary dose equation PCB_{soil} is defined as the "95 UCL PCB concentration in exposed sediment (mg/kg, dw)." Change the text to read: *Mean PCB concentration in exposure area (mg/kg, dw).*

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1 **Page #: 6-1 and 6-2** **Lines #: 28 to 2 on following page.**
Specific Comment #: 46

Delete the following text: "While the AEs address local populations the results in this TBERA are focused on individual receptors." Change the sentence that follows to read: *The results of the TEBRA do not attempt to provide a quantitative assessment of how the magnitude and spatial extent of potential adverse effects could affect the sustainability of local populations. This issue along with the other identified uncertainties of the TBERA will be considered as part of the risk management activities of the FS process.*

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1 **Page #: 6-6 Table B6-1** **Lines #:**
Specific Comment #: 47

The text in the cells describing Approach 2 and 3 of the Hazard Quotient Approach are incomplete.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1 **Page #: 6-5** **Lines #: 14 +**
Specific Comment #: 48

The text describing the calculation of risk-based sediment concentrations (RBCs) is vague and does not readily allow for a check of the calculations. Please add a table or bulleted list of the specific equations used for the various receptors and approaches.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1.2.1 **Page #: 6-9** **Lines #:**
Specific Comment #: 49

The text only describes the dietary (Approach 1) and the measure egg-based (Approach 2) to calculating HQs for the robin. Please add text describing the modeled egg-based (Approach 3).

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1.2.1.2 **Page #: 6-10** **Lines #: 22**
Specific Comment #: 50

The text reads "would be 11 mg/kg compared to the measured mean...." Please change to read: *would be 11 mg/kg (20mg/kg x 0.55 BAF = 11 mg/kg) compared to the measured mean....*

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1.4.2 **Page #: 6-15** **Lines #: (Paragraph 1)**
Specific Comment #: 51

1. Change the sentence: "USEPA's interpretation of this study is more conservative than the authors', but still indicates no adverse effects at a mean soil concentration of 21.6 mg/kg (General Electric 2006)" to read: *USEPA re-evaluated the data and concluded that there was significantly greater mortality at the grid with greatest PCB concentration (38.6 mg/kg), but still found no adverse effects at a mean soil concentration of 21.6 mg/kg (General Electric 2006).*
2. In addition, it would be more straightforward (and incorporate less uncertain estimates) to simply make the comparison of total PCB concentration of grids in the Housatonic shrew study to the interpolated PCB concentrations and to the 1-acre moving window estimates. Modeling the dose adds uncertainty to an otherwise direct comparison. Include a direct comparison of soil concentrations.
3. If it's necessary to model the dose, please confirm the concentration estimate. Our calculation suggests this would be 81 mg/kg rather than 87 mg/kg. This discrepancy could be due to rounding of values with a single significant figure in the exposure factor tables.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.2.3.2.2 **Page #: 6-23** **Lines #: 19**
Specific Comment #: 52

The text states: "In addition, at the request of Dr. James Chapman of USEPA...." Please change to read: *In addition, at the request of USEPA.....*

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.2.4.5 **Page #: 6-29** **Lines #: (First Paragraph)**
Specific Comment #: 53

The line of evidence in this paragraph is not fully transparent and appears to be overreaching based on the available data. This line of reasoning should address the following comments or be removed:

1. Are the modeled TEQs presented actually from the sampling grids presented in the shrew demographic study (Boonstra and Bowman 2003)? If not, what evidence is presented that the modeled dose range presented here (44 to 271 ng TEQ/kg-d) has actually been demonstrated to be a no-effects concentration for shrews, or even to be an accurate assessment of dose? Might it, in fact, be a conservative overestimate of dose? It would be inappropriate to equate a conservative modeled dose for the Housatonic River shrew with the population demographic study and conclude that the modeled dose represents a no-effect concentration.
   The greatest mean grid-specific soil PCB concentration presented in Boonstra and Bowman (2003) was 38.3 mg PCB/kg. Using the shrew exposure factors (as presented in Section 6.1.4.2) and the TEQ conversion factors (recognizing there are uncertainties in PCB and TEQ comparisons across studies) for the Area 1 BERA, this modeled dose to shrews would be 1.4 mg PCB/kg and 13 ng TEQ/kg, apparently considered by USEPA (2003) to be a LOAEL (given the summary presented in Section 6.1.4.2). The corresponding LOAELs (Section 6.1.4.2) would be 0.81 and 7.5 ng TEQ/kg. These TEQ values are substantially less than the range 44 to 271 ng TEQ/kg-d suggested here to be no-effects concentrations.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.2.4.5 **Page #: 6-29** **Lines #: (Second Paragraph)**
Specific Comment #: 54

We do not agree that the mouse risk assessment presented here can be used to argue that the shrew risk model overestimates risk. The exposure estimate for the mouse is less than for the shrew because the mouse diet is dominated by foods with lesser concentrations of PCBs. The shrew experiences greater exposure than the mouse because of its diet, and consequently the model predicts greater risk assuming similar sensitivity. The evidence presented here does not refute the shrew exposure estimate and provides no evidence to refute the TRV or risk conclusions relative to the shrew. This paragraph should be removed.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.2.5.2.3 **Page #6-33** **Lines #:(First Paragraph)**
Specific Comment #: 55

We do not agree that the *primary* uncertainty in applying the Housatonic studies to this TBERA is associated with differences in PCB congener composition. The shrew study has additional sources of significant uncertainty that should be listed here:

- The shrew study was conducted over a single season in which there was repeated flooding of some or all of the sampling grids, requiring local shrew populations to leave the site and then return. Results might differ if the study had been conducted in multiple years including those with more or less flooding or other inter-year variation.
- Shrew tissue PCB concentrations were not measured during the season in which the study was conducted. Tissue PCBs had been measured in shrews two years previous, in the same region, but not in the same grids, and population demographic studies were not conducted. In the absence of contemporaneous tissue concentration data, there is uncertainty about the actual exposure of the shrews present in the grids.
- Possibly the greatest uncertainty in applying the Housatonic shrew study in the true relative PCB exposure of the Area 1 shrews and the Housatonic River shrews. Measured shrew tissue PCB concentrations are not available for direct comparison.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.1.1.1 **Page 6-35** **Lines #: (First Paragraph in section)**
Specific Comment #: 56

We do not agree that Approach 2 has inherently greater uncertainty than Approach 1. For the effects assessment, there is considerable uncertainty around both egg and dietary TRVs (Section 6.3.1.2), although there may be less uncertainty in the mid-sensitivity dietary TRVs than in the egg TRVs, none are species specific. For the exposure assessment, Approach 2 relies on a single modeled relationship that was developed using measured data from the Kalamazoo River floodplain. In contrast, the avian dietary exposure estimates, while species-specific, rely on the product of several estimated exposure factors (diet, ingestion rate, soil ingestion, etc.) that are not site-specific and were either measured at other locations or modeled, and therefore have considerable uncertainty. Given the number of modeled or estimated parameters in the dietary exposure estimates (Approach 1) in comparison to the single site-specific modeled relationship of soil to egg in Approach 2, it is not clear that Approach 2 has less overall uncertainty than Approach 1. The argument that species-specific exposure factors would reduce the uncertainty in the exposure estimate for Approach 2 would only be accurate if species-specific TRVs were being used in the effects assessment. Please provide a more detailed discussion to support your position or remove the text and change Table B6-7.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.1.1.1 **Page 6-36** **Lines #: 6**
Specific Comment #: 57

See previous comment regarding relative uncertainty of Approaches 1 and 2.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.3 **Page 6-40** **Lines #: 1**
Specific Comment #: 58

Given the substantial overlap of 1-acre home ranges with an incremental spacing of 1 ft, it is not clear that 7% of home ranges directly equates to 7% of the spatial area of the site. The moving window is a useful model for smoothing the single-point measured concentrations into a

spatially relevant EPC, but 4 acres represents the area of the site composed of 1 sq ft home range centers greater than the NOAEL TRV. The spatial area used by the woodcocks represented by those home ranges would be greater than 4 acres, but how much greater depends on the spatial distribution and continuity of the 7% of home ranges. It's not clear what ecological or risk management significance is to be gained from this 4-acre estimate. The 4-acre should be removed or additional explanation should be provided relative to the calculation and it's use.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.5 **Page 6-41** **Lines #: 4**
Specific Comment #: 59

The line of reasoning presented in this paragraph is faulty.

1. The Housatonic River shrew study provides no evidence about the sensitivity of shrews relative to other mammals. Rather, the Housatonic River shrew study provides evidence that shrews living on soils with an average concentration of 21.6 mg PCB/kg do not experience substantial effects on population demographics (with the uncertainties noted previously). The actual exposure was not measured in the Housatonic shrew study, and therefore direct comparisons to the dose-response relationships use to develop the mammalian TRVs is not possible.
2. The statement, "the use of the shrew in an exposure model in conjunction with TRVs based on mice and rats is expected to overestimate exposure and consequently risk," is incorrect. There is no reason to assume that the shrew dietary exposure model overestimates exposure for the shrew. We agree that a shrew and an omnivorous rodent such as a white-footed mouse living in the same location on PCB-contaminated soil would not experience the same PCB exposure. PCB exposure for the shrew would likely be much greater due to its higher body weight-normalized ingestion rate and its relatively greater consumption of worms, invertebrates, and soil. We also agree that there is uncertainty in the application of TRVs derived from mouse and rat studies to shrews. However, the relatively greater exposure of the shrew does not provide any information about whether the shrew is more or less sensitive to PCBs than the mouse. If the shrew and the mouse have similar sensitivity to PCBs, then in the same environment the shrew will have a greater likelihood of adverse effects due to its greater exposure in comparison to the mouse.

The text beginning on line 2, with "While the relative...," should be removed through the sentence ending on line 11.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.5 **Page 6-41** **Second paragraph**
Specific Comment #: 60

Mention other sources of uncertainty in the Housatonic shrew study (Comment #12)

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: 6.3.7 **Page 6-42** **Lines #: 11**
Specific Comment #: 61

This implies that high sensitivity vermivorous species exist, and might be observed at the site. Are there any known vermivorous species that have high sensitivity? It would be more accurate to simply state that no high sensitivity vermivorous species are known.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: B2-1 **Page # Lines #:**
Specific Comment #: 62

Add column listing the scientific name for the avian species documented to use Area 1. As discussed in General Comment 2, check notes column for proper and consistent use of scientific names.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: Tables Table B6-2, B5-1, B4-8, B4-7, B4-4 **Lines #:**
Specific Comment #: 63

The number of significant figures displayed varies within and among these tables for some of the method/receptor pairings. Significant figures for each method/receptor pairing should be reconciled such that when recalculating estimates for these values, there is less discrepancy apparently due to rounding. For example, when RBC values in which a single significant figure is displayed are used to recalculate the TRVs, discrepancies up 20% occur. This is likely due to rounding down to a single significant figure for the RBC. While we recognize that there is uncertainty around the second significant figure, it would be preferable if recalculation using the values presented resulted in a closer match.

Commenting Organization: EPA **Commenter: Roark/Dillon**
Section: Table B4-4,
Specific Comment #: 64

In the bottom row of the table, the Parameter column indicates "Soil/Sediment Ingestion Rate." The values in the table are actually dry weight ingestion rate, which is used in calculating the soil/sediment ingestion rate in the dietary exposure calculation. The name of the parameter should be changed to reflect the data in this row, such as "Dry Weight Food Ingestion Rate."

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Table B4-7 **Page #:** **Lines #:**
Specific Comment #: 65

The row with the total Avian TEQs is misplaced and should be moved to follow the main column headings. The table is misleading. Please change the heading of the last column to read: *Median CF (ng/mg)*. In addition, add notes indicating that the CF is the median CF of the ratios of the individual media tPCB and TEQ values.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Table B6-5 **Page #:** **Lines #:**
Specific Comment #: 66

Change all HQ values to read *<1.*

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Figure B6-1 **Page #:** **Lines #:**
Specific Comment #: 67

Add Approach 3 to the figure. Note 1 is unclear. Please provide a better description.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Figure B6-2 **Page #:** **Lines #:**
Specific Comment #: 68

Add Approach 3 to the figure. Note 1 is unclear. Please provide a better description. There is an erroneous mark in the middle of the figure.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Figure B6-6 **Page #:** **Lines #:**
Specific Comment #: 69

Add Approach 3 to the figure. Note 1 is unclear. Please provide a better description.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Figure B6-18 **Page #:** **Lines #:**
Specific Comment #: 70

Capitalize Shrew in the first x axis label. It is misleading to place the mammals in the Mid-range sensitivity grouping. Please break-out the mammals and the birds. Only include the birds in the mi-range diet sensitivity group. Add the red-tailed hawk to the high sensitive diet group.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: Figure B6-19 **Page #:** **Lines #:**
Specific Comment #: 71

Capitalize Shrew in the first x axis label. It is misleading to place the mammals in the Mid-range sensitivity grouping. Please break-out the mammals and the birds. Only include the birds in the mi-range diet sensitivity group. Add the red-tailed hawk to the high sensitive diet group.

APENDIX M – OTHER CONSTITUENTS IN SITE MEDIA

Commenting Organization: EPA **Commenter: Saric**
Section: Appendix M **Page #: 6-9** **Lines #: NA**
Specific Comment #: 72

The PCDD/PCDF in sediment conclusions are inconsistent with the data presented in Table M-2. It appears from the table that the PCDD/PCDF (TEQ) data in sediment exceed the direct contact exposure. Further, were any of these data points co-located with PCB contamination? A discussion on the collocation with PCBs may be relevant here.